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SECRET

S E C R E T 17025Z APR 68 CITE [redacted] 3492 1968 APR 17 03 14Z 25X1
[redacted] 25X1

SUBJECT EVALUATION OF FIRST ACCEPTABLE [redacted] 25X1
MATERIAL IN THE 112-B SYSTEM

1. THE 112-B CAMERA SYSTEM IS BEING USED IN THE "RED DOT FLIGHT TESTS" TO EVALUATE THE CAPABILITIES OF VARIOUS [redacted] EMULSIONS AT HIGH ALTITUDES. MISSION GT-68-78 WAS 25X1
FLOWN 24 FEBRUARY 68 USING SO-121 FILM IN THE FWD-LOOKING CAMERA AND [redacted] (K-2) FILM IN THE AFT-LOOKING 25X1
CAMERA (THE K-2 MATERIAL FROM THE AFT-LOOKING CAMERA WAS NOT RECEIVED AT NPIC). A SECOND FLIGHT, MISSION GT-68-101, WAS INITIATED 15 MARCH 68 USING TYPE 3404 FILM IN THE FWD-LOOKING CAMERA AND K-2 FILM IN THE AFT-LOOKING CAMERA. (NO REQUIREMENTS WERE LEVIED FOR THE EVALUATION OF THE TYPE 3404 FILM.) THE SO-121 FROM THE FIRST FLIGHT WAS COMPARED WITH THE K-2 FROM THE SECOND FLIGHT. VEHICLE PARAMETERS APPEAR SIMILAR, AND ATMOSPHERIC CONDITIONS ARE ASSUMED TO BE COMPARABLE FOR BOTH FLIGHTS ALTHOUGH NO METERLOGICAL READINGS, PILOT REPORTS, OR GROUND TRUTH DATA HAVE BEEN

PAGE 2 [redacted] 3492 S E C R E T 25X1
RECEIVED. FOLLOWING IS AN ANALYSIS OF THE [redacted] PRODUCTS 25X1
FROM THE TWO MISSIONS:

A. SYSTEMS ANALYSIS

(1) THE TIME TRACK IS RECORDED WITHIN THE FORMAT ON THE SO-121 FILM FROM MISSION GT-68-78, IN ADDITION, THE BINARY REFERENCE MARKS, CAMERA NUMBER, AND FRAME COUNTER NUMBERS WERE NOT RECORDED.

THE TIME TRACK WAS NOT IMAGED ON THE K-2 FILM FROM MISSION GT-68-101.

(2) NO PROBLEMS WERE EXPERIENCED IN USING THE THIN BASE SO-121 FILM IN THE 112-B CAMERA SYSTEM. THE AFT CAMERA WAS RE-FOCUSED TO ACCOMMODATE THE INCREASED THICKNESS AND LOWER PLIANCY OF THE K-2 FILM (COMPARED TO SO-121 FILM). IT IS NOT KNOWN IF THE FOCUS WAS OPTIMIZED FOR THIS FILM.

(3) THERE WERE NO APPARENT VEHICLE PROBLEMS.

(4) THE SO-121 FILM WAS PROCESSED IN THE GRAFTON PROCESSOR (MODIFIED STANDARD PROCESS). THE K-2 FILM WAS SLIT INTO 35 MM WIDTHS AND PROCESSED IN COMMERCIAL PROCESSING MACHINES (THE ONLY K-2

PAGE 3 [redacted] 3492 S E C R E T 25X1
PROCESSING MACHINES IN EXISTENCE ARE FOR 35 MM FILMS).

B. COMPARATIVE IMAGE ANALYSIS

(1) THE [redacted] CONTRAST OF THE SO-121 FILM IS 25X1
HIGHER THAN THE K-2 FILM. MORE DETAIL AND BETTER TONAL SEPARATION IS APPARENT IN THE LOW CONTRAST AREAS OF THE SO-121 FILM. THE K-2 FILM HAS A GENERAL, FLAT, WASHED OUT, DESATURATED APPEARANCE.

(2) THE DENSITY OF THE SO-121 FILM IS NEAR OPTIMUM AS IS THE DENSITY OF THE MID-TONES OF THE K-2 FILM. HOWEVER, THE COMPRESSED TONES (TOE AND SHOULDER AREAS) ON THE K-2 FILM CAUSE THE LOW CONTRAST, WASHED OUT APPEARANCE.

(3) THE [redacted] BALANCE OF THE SO-121 FILM IS 25X1
MORE PLEASING. A [redacted] CORRECTION FILTER WITH 25X1
A VALUE OF 0.15 (CC15C) WILL BALANCE THE K-2 FILM TO THE SO-121 FILM BUT DOES NOT IMPROVE THE CONTRAST OR INFORMATION CONTENT. THE FILM FROM BOTH MISSIONS

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GROUP 1
Excluded from automatic downgrading and declassification

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WAS VIEWED ON A [redacted] LIGHT TABLE WITH A COLOR TEMPERATURE OF 9,500 DEGREES KELVIN (HIGH IN BLUE) AT 900 FOOT LAMBERTS. 25X1

 25X1

(4) SINCE BAR RESOLUTION TARGETS WERE NOT DETECTED, EMPIRICAL ESTIMATES, BASED ON PREVIOUS EVALUATIONS, PLACE THE BEST RESOLUTIONS FROM BOTH EMULSIONS AT APPROXIMATELY [redacted] (BAR PLUS SPACE). 25X1
THE FILM WAS SCANNED THROUGHOUT AND VIEWED WITH THE [redacted] ZOOM 70 MICROSCOPE AT VARIOUS MAGNIFICATIONS. 25X1
AT LOW MAGNIFICATIONS (UP TO 15X), THE RESOLUTIONS WERE COMPARABLE; HOWEVER, THE CONTRAST, DENSITY, AND GENERAL APPEARANCE OF THE SO-121 FILM MADE IT PREFERABLE. TEN TARGETS, FROM FRAMES 9, 16, 39, 70, AND 95 OF MISSION GT-68-78 AND FRAMES 18, 42, 98, 123, AND 130 OF MISSION GT-68-101 WERE SELECTED FOR DETAILED STUDY. THESE TARGETS WERE COMPARED IN A DUO STAR COMPARISON MICROSCOPE AT MAGNIFICATIONS OF 40X TO 100X. AT THESE MAGNIFICATIONS, THE K-2 FILM IS SHARPER AND THE IMAGERY HOLDS TOGETHER BETTER. THE SO-121 FILM IS HIGHER IN APPARENT GRAININESS.

(5) THE [redacted] SATURATION OF THE SO-121 IS BETTER THAN THAT OF THE K-2 FILM. THIS IS PARTIALLY 25X1

 25X1

DUE TO THE LOW CONTRAST OF THE K-2 FILM WHICH MAY BE IMPROVED BY MODIFYING THE EXPOSURE OR FILTRATION.

2. CONCLUSIONS: THE RESULTS OF THIS SINGLE TEST INDICATE THE EXPOSURE, DENSITY, CONTRAST, [redacted] AND [redacted] OF SO-121 FILM IS SUPERIOR TO THE K-2 FILM. 25X1 25X1
HOWEVER, THE SO-121 IS SPECIFICALLY DESIGNED FOR HIGH ALTITUDE [redacted] THE IMAGE SHARPNESS OF THE K-2 FILM IS SLIGHTLY BETTER THAN THE SO-121 FILM. 25X1

3. RECOMMENDATIONS: ADDITIONAL TESTS USING THE K-2 FILM SHOULD BE CONDUCTED. THE FOCUS AND FILTRATION SHOULD BE OPTIMIZED FOR THE K-2 MATERIAL. BOTH TYPES OF FILM SHOULD BE FLOWN SIMULTANEOUSLY. THE VEHICLE AND ATMOSPHERIC PARAMETERS SHOULD BE MADE AVAILABLE TO THE EVALUATORS. REPRODUCTIONS FROM BOTH FILMS SHOULD BE PROVIDED FOR A DETAILED ANALYSIS SINCE EXPOLITATIONS ARE MADE WITH REPRODUCTIONS.

4. BECAUSE OF THE LIMITED QUANTITY OF CULTURED AREAS AND THE OBVIOUS DIFFERENCE BETWEEN THE TWO FILMS, THE PHOTOGRAPHIC INTERPRETERS WERE NOT ASKED FOR THEIR OPINION OF THESE MATERIALS. UPON RECEIPT OF FUTURE MATERIALS WITH

 25X1

BETTER [redacted] IN THE K-2 EMULSIONS, THERE WILL BE A P. I. SUITABILITY INPUT TO COMPARATIVE EVALUATIONS BETWEEN THE TWO EMULSIONS. 25X1

S E C R E T

END OF MSG

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